Small Business Innovation Research/Small Business Tech Transfer

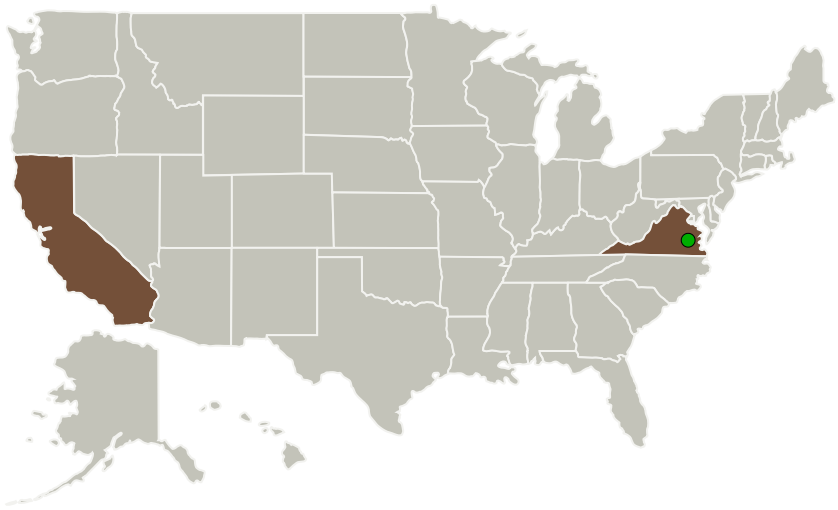
Spatially Coherent Optical Velocimeter Array for Rapid Guided-wave NDE, Phase I

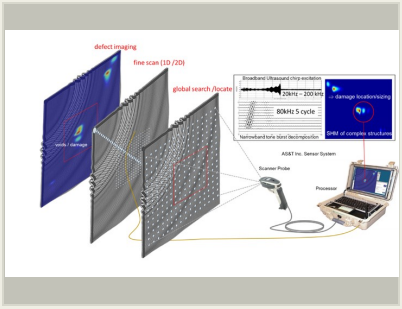
Completed Technology Project (2014 - 2014)

Project Introduction

The pace and progress of new sensor technology development continues to lag far behind the broad ranging potential offered by guided wave NDE. In response to NASA solicitation H13.01 for Advanced NDE Techniques for Complex Built-up Structures, Advanced Systems and Technologies Inc., propose a collaborative program which seeks to combine an advanced sensor technology for rapid wide-area capture of ultrasound wave-field data with recent advances in NDE guided wave signal processing. This proposal describes how the Spatially Coherent Optical Vibrometer Array (SCOVA), combined with chirped ultrasound excitation and narrow tone-band decomposition provide deep data sets for application of new spatio-temporal and spatio-spectral analyses to address a broad range of NDE functions pertinent to NASA spaceflight structures. In form and function, SCOVA offers a sensor geared towards practical deployment of guided wave NDE. The ability of SCOVA to capture swept ultrasound data at hundreds of points simultaneously, offers a major advancement in the practical application of guided wave NDE targeting multiple defect modalities in current and future complex spaceflight structures.

Primary U.S. Work Locations and Key Partners





Spatially Coherent Optical Velocimeter Array for Rapid Guided-wave NDE Project Image

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Organizations Performing Work	Role	Type	Location
Advanced Systems & Technologies, Inc.	Lead Organization	Industry	Irvine, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

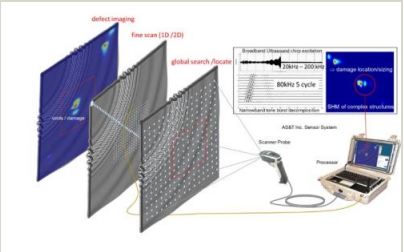
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140527)*

Images



Project Image
Spatially Coherent Optical Velocimeter Array for Rapid Guided-wave NDE Project Image *(https://techport.nasa.gov/image/134075)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Systems & Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

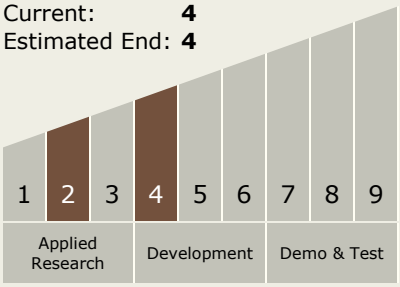
Carlos Torrez

Principal Investigator:

James M Kilpatrick

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.5 Nondestructive Evaluation and Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System